



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/761,881

01/20/2004

Chih-Wei Huang

67,200-1225

3162

7590
TUNG & ASSOCIATES
Suite 120
838 W. Long Lake Road
Bloomfield Hills, MI 48302

04/18/2007

EXAMINER

KACKAR, RAM N

ART UNIT

PAPER NUMBER

1763

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
--	-----------	---------------

3 MONTHS

04/18/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/761,881

Applicant(s)

HUANG ET AL.

Examiner

Ram N. Kackar

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 17-20 is/are pending in the application.
- 4a) Of the above claim(s) 17-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/29/2006 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. **Claims 1-2, 6, 9-10 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Ke et al (US 6284093).**

Ke et al disclose an insert ring (Fig 6-50) with an annular step (58) encircling a wafer support in a plasma-processing chamber (Col 8 lines 28-38). The insert ring is surrounded and supported by a shadow ring (30) where in the shadow ring is extending vertically higher than insert ring. The insert ring comprises silicon (Col 7 lines 65-67).

Art Unit: 1763

4. **Claims 1, 6, 9 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Ishii et al (US 5529657).**

Ishii et al disclose an insert ring (Fig 5-6b) with an annular step encircling a wafer support in a plasma-processing chamber. The insert ring is surrounded and supported by a shadow ring (6a) where in the shadow ring is extending vertically higher than insert ring.

5. **Claims 1-2, 6, 9-10 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Daugherty et al (US 6344105).**

Daugherty et al disclose an insert ring (Fig 5-508) with an annular step encircling a wafer support in a plasma-processing chamber. The insert ring is surrounded and supported by a shadow ring (512) where in the shadow ring is extending vertically higher than insert ring. The insert ring comprises semiconductor material which could be doped like silicon carbide (Col 7 line 66 Col 7 line 21).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1763

7. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanno et al (US 20030029572) in view of Ke et al (US 6284093).

Kanno et al disclose an as insert ring (focus ring Fig 8-32) of silicon (Paragraph 60) with an annular step encircling a wafer support in a plasma processing chamber. The insert ring is surrounded by a shadow ring (unnumberd part) and is supported by it.

Kanno et al do not disclose the outer portion of shadow ring extending vertically higher than insert ring.

Ke et al disclose an insert ring (Fig 6-50) with an annular step (58) encircling a wafer support in a plasma-processing chamber (Col 8 lines 28-38). The insert ring is surrounded and supported by a shadow ring (30) where in the shadow ring is extending vertically higher than insert ring. The insert ring comprises silicon (Col 7 lines 65-67). Ke et el further teach that the height of the shadow ring affects the processing in several ways like depletion effect near the perimeter, confinement time of reactive species near the perimeter and focusing effect.

Therefore it would be obvious to one of ordinary skill in the art at the time of invention to adjust the height of the shadow ring to control process uniformity.

8. Claims 3-5, 7- 8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ke et al (US 6284093) in view of Park et al (US 6464794).

Ke et al do not explicitly disclose the height of the insert ring as in Fig 6.

Park et al disclose an insert ring (edge ring Fig 2-24) of silicon (Col 5 lines 42-45) with an annular step encircling a wafer support in a plasma-processing chamber.

Art Unit: 1763

Park et al do not explicitly disclose the height of the edge ring as in Fig 2-24 but disclose that in general the height is 3-6-4.5 mm (Col 8 lines 20-30). Further the height of the taller part could be increased by 2-4-3.0 mm (Col 10 lines 62-67). Park further teaches that the height is determined by process requirement as the focus ring height is known to affect the plasma orientation and the lift of the ring expected.

Therefore having a height of 3.5 mm of one part and of 1.5 mm of the other part would have been an obvious compromise for one of ordinary skill in the art at the time of invention.

Response to Arguments

Applicant's arguments filed 12/29/2006 have been fully considered but they are not persuasive.

Applicant argues against the references cited. In response several rejections are removed. However rejections as above stand as new limitations are submitted.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ram N. Kackar whose telephone number is 571 272 1436. The examiner can normally be reached on M-F 8:00 A.M to 5:P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571 272 1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1763

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ram Kackar
Primary Examiner AU 1763